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A Study on Assessment of Drug Prescription Pattern and Therapeutic Outcomes for Management of Angina Pectoris Patients in a Tertiary Care Hospital

Dr. S.G. Bhavana*[1], A. Sandhya[2], E. Chaitanya[2], P. Lokesh[2], Sk. Israt Irfana[2]

[1]*Assistant Professor, Rao's college of Pharmacy, Chemudugunta, Nellore, AP, India-524320*
[2]*B.Pharm student, Rao's college of Pharmacy, Chemudugunta, Nellore, AP, India-524320*
***Corresponding E-mail:** bhavanasibbena@gmail.com*

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ABSTRACT
Introduction: Acute coronary syndrome includes unstable angina, non-ST-elevation myocardial infarction, and ST-elevation myocardial infarction. **Methodology:** The prospective observational study was carried out for a period of 6 months. The study was conducted in cardiology department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 185 patients were enrolled in the study. **Aim:** The study aimed to assess the drug prescription pattern and therapeutic outcomes for management of angina pectoris patients in a tertiary care hospital. **Results and Discussion:** In our study 37-46 years age patients were 56(30.27%) were more as compared to other ages. In our study male patients were more 142(76.25%), compared to female patients were 43 (23.24 %). Clinical manifestations of angina pectoris patients includes Cough patients were more 48(25.94%) compared to other symptoms. Drug prescribing pattern for angina pectoris management includes Anticoagulants prescribed drugs patients were more 54(29.18%), compared to other drugs. WHO Drug prescribing indicators includes Total number of patient's prescription analyzed were 185, Total number of drugs prescribed were 1295, Average number of drugs per prescription were 7.0, Number of drugs prescribed by Brand name was more 1185, compared to Number of drugs prescribed by Generic name was 110, and Drugs included in National list of essential medicines was 985. **Conclusion:** To lower the cost of medicines health care practitioners should be encouraged to prescribe medications with generic names. The findings of our study on the patterns of drug prescription would develop a framework for ongoing prescription assessment in a healthcare setting. Rational use of drugs practice must be improved in clinical settings to maximize the benefit of drug therapy in patient care.
Keywords: Unstable angina, Health care practitioners, Drug prescription, Rational use of drugs, Healthcare setting.

1. Introduction

Chest pain is one of the most common reasons for seeking medical attention in both emergency and outpatient cardiology settings. Among this symptom's various potential causes, cardiac ischemia, particularly acute coronary syndrome, must be ruled out promptly, given its life-threatening nature. Acute coronary syndrome includes unstable angina, non-ST-elevation myocardial infarction, and ST-elevation myocardial infarction. Meanwhile, stable angina, which corresponds to the presentation of chronic coronary syndrome reflects a longstanding and typically exertional manifestation of myocardial ischemia[1-2]. These conditions result from a mismatch between myocardial oxygen supply and demand caused by flow-limiting atherosclerotic lesions.

Etiology

Congenital coronary artery anomalies, including anomalous origin, myocardial bridging, and coronary artery fistula. Coronary artery embolism arising from atrial fibrillation, infective endocarditis, or prosthetic valve thrombi

- Spontaneous coronary artery dissection
- Coronary artery spasm
- Microvascular angina, also known as cardiac syndrome X
- Severe aortic stenosis
- Hypertrophic cardiomyopathy
- Severe anemia or hypoxemia
- Hypertension
- Coronary artery vasculitis
- Infiltrative disorders such as amyloidosis and sarcoidosis

Pathophysiology: CCS results from atherosclerotic plaque formation within the coronary arteries, producing flow-limiting stenoses. These lesions demonstrate a luminal narrowing of 50% or greater in the left main coronary artery or at least 70% in other major coronary vessels. Such obstructions diminish coronary perfusion during exertion or stress, resulting in effort-induced myocardial ischemia. Although ischemia may manifest as stable angina, many lesions remain clinically silent. Despite their apparently stable morphology, significant plaques retain the potential for future destabilization, precipitating ACS[3-6].

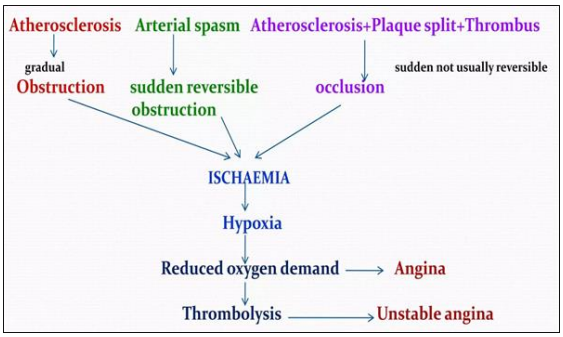

Fig 1: Pathophysiology

Physical examination findings are typically unremarkable. Manifestations such as acute pulmonary edema, malignant arrhythmias, cardiac arrest, or hemodynamic instability strongly indicate ACS and warrant immediate intervention. Syncope rarely reflects myocardial infarction, as ventricular tachycardia seldom self-terminates and usually progresses to ventricular fibrillation, making transient syncope an unlikely ACS presentation. ACS may present atypically in patients with diabetes, lacking chest pain, instead manifesting with marked malaise.

Treatment / Management

Treatment for stable angina is geared toward reducing risk factors for presumed underlying coronary heart disease. An interdisciplinary approach would likely benefit individuals with multiple comorbidities: nutrition, diabetic educator, addiction counselor, and physical and occupational therapy[7-11].

Pharmacological management of angina pectoris

Although the general principles of treatment (ie lifestyle modification and risk-factor management) are applicable to all patients with angina, treatment should be individualized where possible. It should aim to reverse or reduce the underlying pathophysiological mechanisms in order to relieve symptoms and improve cardiovascular risk profile.

Treatment of chest pain episodes

Episodes of angina are best treated with sublingual glyceryltrinitrate (GTN). GTN acts as a nitric oxide donor, causing systemic and coronary vasodilatation. GTN is rapidly absorbed in the sublingual mucosae and its effects usually occur within 2–10 minutes.

First-line anti-anginal drugs

β-adrenergic receptor blockers (beta-blockers) and calcium-channel blockers are considered to be first-line anti-anginal drugs and have been shown in many studies to prevent angina and myocardial ischaemia.

Second-line anti-angina therapies

For patients whose symptoms are not well controlled by beta-blockers and calcium-channel blockers, or if contraindications exist for these agents, several options supported by NICE guidelines[4] are available. These include: vasodilators such as long-acting nitrates and nicorandil, a drug that selectively slows the heart rate; ivabradine, and ranolazine, an agent that acts on the fast sodium current to improve cardiac metabolism.

Non Pharmacological steps for angina pectoris

Tobacco cessation results in the biggest risk reduction.

Cigarette smoking is the leading avoidable cause of premature death. The risk of cardiovascular mortality in current smokers is roughly 2 times that of nonsmokers. Interestingly enough, the risk of cardiovascular mortality in former smokers is roughly equal to that of individuals who have never smoked[12-13].

Cholesterol reduction

Evidence has supported that adherence to the Mediterranean diet (high in vegetables and fruits) reduces the risk of cardiovascular disease.

Blood pressure control: The 2017 AHA/ACC guidelines define hypertension as systolic blood pressure ≥130 mmHg or diastolic pressure ≥80 mmHg. Goal blood pressure is unique to each patient; however, it is important to remember that for each 20/10 mmHg increase in systolic/diastolic blood pressure, evidence has supported a 2-fold increased risk of coronary heart and stroke-related mortality.

Diabetes mellitus management

Weight reduction, increased physical activity, and adequate control of comorbidities are recommended.

Weight loss

Obesity is the second leading modifiable cause of premature death. Weight-loss regimens should be catered to each patient, and the discussion should include lifestyle modifications and surgical options if appropriate.

Aerobic exercise: An average of 150 minutes of moderate-intensity exercise per week or 75 minutes of high-intensity exercise per week has been shown to decrease overall cardiac risk factors and, in turn, the risk of coronary heart disease.

2. Methodology

The prospective observational study was carried out for a period of 6 months. The study was conducted in cardiology department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 185 patients were enrolled in the study.

Study Design: It was Prospective observational study.

Study Period: The Present study was conducted for a period of six months.

Study site: The Present study was conducted in cardiology department in a tertiary care hospital.

Sample size: It was 185 Patients.

Inclusion criteria

- Patients with age of more than 18 years.
- Patients who are willing to give consent.
- Recently diagnosed with angina pectoris.
- Patients receiving treatment for angina pectoris.

Exclusion criteria

- Patients below 18 years.
- Patients who were not willing to join in the study.
- Special population including pregnant women and lactating women.
- Psychiatric abnormalities.

Institutional ethics committee (IEC) consideration:

The research protocol was submitted to ethical committee and ethical Committee was permitted to perform the research work in the selected department of a tertiary care hospital.

Patient data collection and management: The data collection form contains information regarding age, sex, diagnosis, past medical history, medication history, laboratory data, and diagnosis, dose and frequency of administration and duration of therapy was collected from the patients treatment chart.

Statistical analysis: The data was represented as percentages. The $P<0.05$ was considered to indicate a statistically significant difference.

3. Results

Table 1: Age wise distribution

S.No	Age	Total (N=185)	Percentage (%)
1.	25-29	50	27.02
2.	30-36	42	22.70
3.	37-46	56	30.27
4.	47-57	37	20
	Total	**185**	

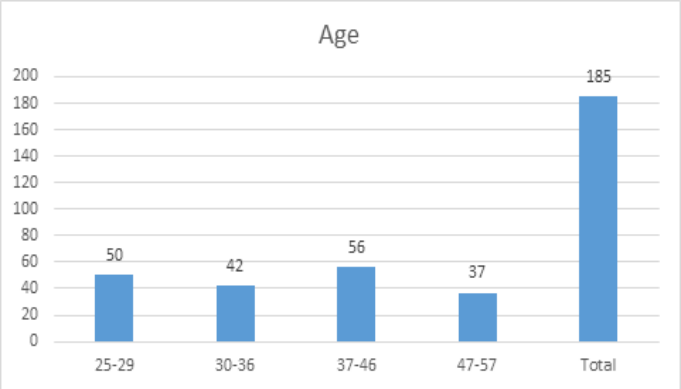

Fig 1: Age wise distribution

Table 2: Gender

S.No	Gender	Total (N=185)	Percentage (%)
1.	Male	142	76.75
2.	Female	43	23.24
	Total	**185**	

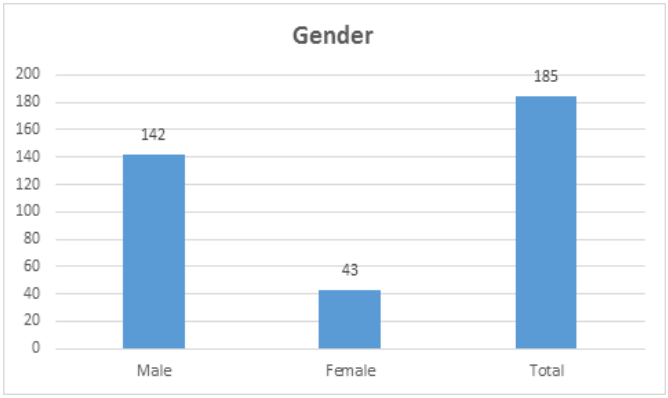

Figure 2: Gender

Table 3: Locality status

S.No	Locality status	Total (N=185)	Percentage (%)
1.	Rural	113	61.08
2.	Urban	72	38.91
	Total	**185**	

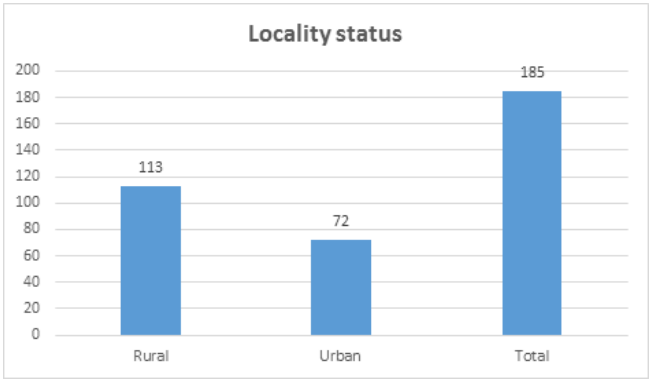

Figure 3: Locality status

Table 4: Education

S.No	Education	Total (N=185)	Percentage (%)
1	Diploma	55	29.72
2	SSC	49	26.48
3	Degree	39	21.08
4	Post-graduation	42	22.70
	Total	**185**	

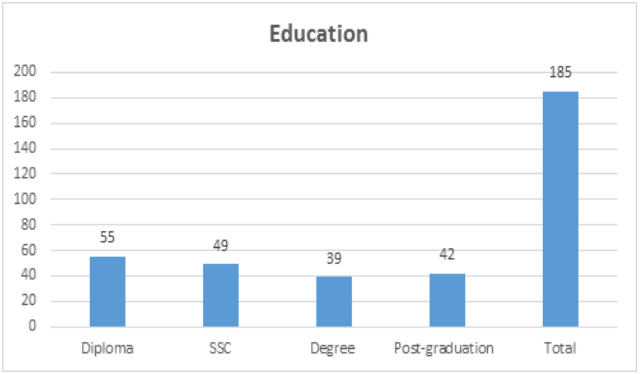

Figure 4: Education

Table 5: Social habits

S.No	Social habits	Total (N=185)	Percentage (%)
1	Smoking	117	63.24
2	Alcohol	68	36.75
	Total	**185**	

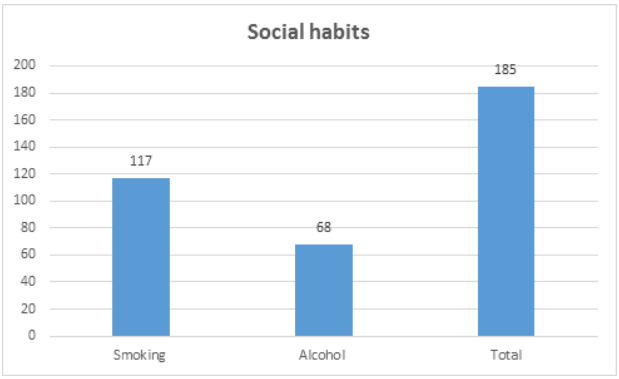

Fig 5: Social habits

Table 6: Socioeconomic status

S.No	Socioeconomic status	Total (N=185)	Percentage (%)
1.	Low	60	32.43
2.	High	48	25.94
3.	Middle	77	41.62
	Total	**185**	

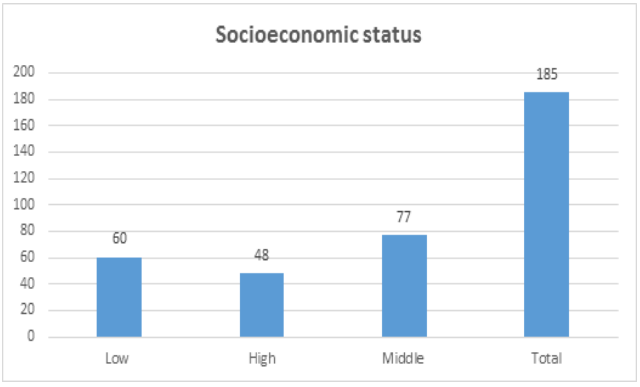

Figure 6: Socioeconomic status

Table 7: Classification of Heart failure

S.No	Heart failure class	Total (N=185)	Percentage (%)
1.	Class I	33	17.83
2.	Class II	37	20
3.	Class III	65	35.13
4.	Class IV	50	27.02
	Total	**185**	

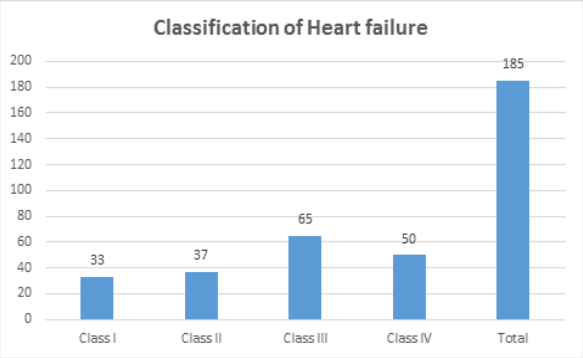

Figure 7: Classification of Heart failure

4. Discussion

- In our study 37-46 years age patients were 56(30.27%) were more as compared to other ages.
- In our study male patients were more 142(76.25%), compared to female patients were 43 (23.24 %).
- In our study Rural area patients were more 113 (61.08 %), compared to urban area patients were 72 (38.91 %).
- In our study Education wise patients includes Diploma were more 55(29.72 %), compared to SSC were 49 (26.48 %), Degree were 39 (33%). Post-graduation were 42(22.70%).
- In our study social habits patients includes smoking patients were more 117 (63.24%), compared to alcohol patients were 68 (36.75%).
- In our study socioeconomic status includes middle income patients were more 77 (41.62%) compared to low income patients were 60(32.43%), high income patients were 48 (25.94%),
- The classification of Heart failure patients includes Class III patients were more 65 (35.13%) compared to Class I patients were 33 (17.83%), Class II patients were 37 (20%), Class IV patients were 50(27.02%).
- Occupation wise distribution includes Employee were more 72(38.91%) compared to Farmer were 33(17.83%), House wife were 41(22.16%), Driver were 39(21.08%).
- Classification of cardiac emergencies includes Cardiac arrhythmias patients were more 76(41.08%) compared to Myocardial infarction patients were 36(19.45%), Unstable angina patients were 24(12.97%), Congestive heart failure patients were 49(26.48%).
- Diagnosis tools for angina pectoris includes Electrocardiogram were more 95(51.35 %), compared to Troponin levels were 52(28.10 %), Angiography were 38(20.54 %).
- No of days admission in hospital includes 1-7 days patients were more 102(55.13%), compared to 8--10 days patients were 38(20.54%), 11--12 days patients were 45(24.32%).
- Comorbidities includes Renal failure patients were more 46(24.86%), compared to Stroke patients were 25(13.51%), Hypothyroidism patients were 38(20.54%), Rheumatoid arthritis patients were 43(23.24%), Epilepsy patients were 33(17.83%).
- Clinical manifestations of angina pectoris patients includes Cough patients were more 48(25.94%) compared to Chest pain patients were 41(22.16%), Shortness of breath patients were 28(15.13%), Chest tightness patients were 33(17.83%), Sweating patients were 35(18.91%).
- Lab test for Angina pectoris includes ECG lab test patients were more 56(30.27%), compared to Blood test patients were 26(14.05%), Coronary angiogram lab test patients were 33 (17.83%), Blood sugar test lab test patients were 29(15.67%), Doppler studies lab test patients were 41(22.16%).
- Drug prescribing pattern for angina pectoris management includes Anticoagulants prescribed drugs patients were more 54(29.18%), compared to Antiplatelets prescribed drugs patients were 22(11.89%), Thrombolytics prescribed drugs patients were 19(10.27%), Statins prescribed drugs patients were 38(20.54%), Beta blockers prescribed drugs patients were 30(16.21%), ACE Inhibitors prescribed drugs patients were 22(11.89%).
- WHO Drug prescribing indicators includes Total number of patient's prescription analyzed were 185, Total number of drugs prescribed were 1295, Average number of drugs per prescription were 7.0, Number of drugs prescribed by Brand name was more 1185, compared to Number of drugs prescribed by Generic name was 110, and Drugs included in National list of essential medicines was 985[14-15].

5. Conclusion

- In our study 37-46 years age patients were 56(30.27%) were more as compared to other ages.
- The classification of Heart failure patients includes Class III patients were more 65 (35.13%) compared to Class I patients were 33 (17.83%), Class II patients were 37 (20%), Class IV patients were 50(27.02%).
- Drug prescribing pattern for angina pectoris management includes Anticoagulants prescribed drugs patients were more 54(29.18%), compared to Antiplatelets prescribed drugs patients were 22(11.89%), Thrombolytics prescribed drugs patients were 19(10.27%), Statins prescribed drugs patients were 38(20.54%), Beta blockers prescribed drugs patients were 30(16.21%), ACE Inhibitors prescribed drugs patients were 22(11.89%).
- The primary treatments for angina pectoris include antiplatelet drugs, anti-coagulants, thrombolytics, and statins, which are essential in the management of the clinical condition. Both healthcare professionals and patients should focus on managing risk factors and adopting healthier lifestyles would brings greater efforts for management of angina pectoris[16].
- Increasing age, random changes in lifestyle, lack of physical activities, increased stress, altered social habits can raise the risk of cardiovascular disorders. In the present study, the prescribing pattern of drugs in cardiovascular system were assessed.

- It will helps prescribers improve patient management by rationalizing prescribing practices. Regular workshops for the health care professionals and dissemination of treatment guidelines could promotes rational use of the drug.
- To lower the cost of medicines health care practitioners should be encouraged to prescribe medications with generic names[17].
- The findings of this study on the patterns of drug prescription would develop a framework for ongoing prescription assessment in a healthcare setting. Rational use of drugs practice must be improved in clinical settings to maximize the benefit of drug therapy in patient care.

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Conflict of Interests
The authors declare no conflict of interest

Ethics Approval: Not applicable

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AI Tool Declaration
The authors declare that no AI and related tools are used to write the scientific content of this manuscript.

Data Availability
Data will be available on request

6. References
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